

Application No. 10/646,945 Supplemental Amendment to Claims
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19. (New) A method of manufacturing an array of carbon nanotubes comprising:

 providing a substrate;

 arranging a predetermined pattern of nanotube growth sites on said substrate;

 growing at least one carbon nanotube from said growth sites on said substrate.

20.(New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, including:

 growing said carbon nanotubes to a specific length.

21. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, including:

 influencing growth direction of said carbon nanotubes.

22.(New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, including:

 providing a feedback control system to monitor and control said growing of said carbon nanotubes on said substrate.

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23.(New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, including:
growing said carbon nanotube to a specific size.

24.(New) The method of manufacturing an array of carbon nanotubes as recited in claim 23, including:
controlling said growing of said carbon nanotube on said substrate to a specific diameter.

25.(New) The method of manufacturing an array of carbon nanotubes as recited in claim 21, wherein said influencing growth direction of said carbon nanotubes comprises:
introducing an external field to said pattern of carbon nanotube growth sites on said substrate.

26.(New) The method of manufacturing an array of carbon nanotubes as recited in claim 25, wherein said external field comprises a static electric field.

27. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 25, wherein said external field comprises an electro-magnetic field.

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28. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, wherein said predetermined pattern of carbon nanotube growth sites comprises a periodic pattern of growth sites.
29. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, wherein said growth sites include a metal therewith.
30. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, wherein said growth sites include a metal oxide therewith.
31. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, wherein said substrate is comprised of a doped material.
32. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, wherein said substrate is comprised of silicon.
33. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 22, wherein said feedback control system comprises an optical system.

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34. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, wherein growth sites are comprised of spaced-apart periodic growth locations comprising depressions.

35. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 34, including:

depositing a nanoparticle in said depressions; and
growing said carbon nanotubes from said nanoparticles in
said depressions in said substrate.

36. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 19, wherein said pattern of nanotube growth sites comprises an ordered array of growth locations on said substrate.

37. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 36, including:

heating said substrate in a chamber;
introducing a carbon bearing gas to said chamber to
create carbon nanotubes on said growth locations on said
substrate;

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applying an external controlling field to said substrate in
said chamber; and
controlling growth of said carbon nanotubes on said
substrate.

38.(New) The method of manufacturing an array of carbon nanotubes as
recited in claim 36, wherein said external controlling field comprises a
static electric field.

39. (New) The method of manufacturing an array of carbon nanotubes as
recited in claim 36, wherein said external controlling field comprises a
magnetic field.

40.(New) The method of manufacturing an array of carbon nanotubes as
recited in claim 36, wherein said external controlling field comprises
an electromagnetic field.

41.(New) The method of manufacturing an array of carbon nanotubes as
recited in claim 36, including:
separating adjacent carbon nanotubes by inducing a like-
charge in said adjacent carbon nanotubes.

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42. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 35, including:

orienting and directing carbon nanotube growth by orienting said depressions as guides for said carbon nanotubes.

43. (New) The method of manufacturing an array of carbon nanotubes as recited in claim 42, wherein said depressions also comprise apertures extending through said substrate.

44. (New) A method of controlling growth of a nanotube on a substrate, comprising:

providing a substrate;

growing at least one nanotube on said substrate;

applying an external field to said at least one nanotube on said substrate during said growing of said at least one nanotube on said substrate; and

orienting said external field to permit the influencing of growth of said at least one nanotube on said substrate.

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45. (New) The method of controlling growth of a nanotube on a substrate, as recited in claim 44, wherein said external field comprises a static electric field.

46. (New) The method of controlling growth of a nanotube on a substrate, as recited in claim 44, wherein said external field comprises an electromagnetic field.

47. (New) A method of manufacturing an array of carbon nanotubes on a substrate, comprising:

 providing a substrate;

 arranging an ordered pattern of growth sites on said

 substrate; and

 growing a plurality of nanotubes on said plurality of growth sites on said substrate.

48. (New) The method of manufacturing an array of carbon nanotubes on a substrate as recited in claim 47, including:

 growing said nanotubes to a specific length.

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49. (New) The method of manufacturing an array of carbon nanotubes on a substrate as recited in claim 47, including:

arranging a metal at said growth sites on said substrate.

50. (New) The method of manufacturing an array of carbon nanotubes on a substrate as recited in claim 47, including:

arranging a metal oxide at said growth sites.

51. (New) The method of manufacturing an array of carbon nanotubes on a substrate as recited in claim 47, wherein said substrate is comprised of silicon.

52. (New) The method of manufacturing an array of carbon nanotubes on a substrate as recited in claim 47, wherein said substrate is comprised of a doped material.

53. (New) A method of manufacturing a carbon nanotube, comprising:

providing a substrate on which to grow an array of nanotubes;

growing an array of nanotubes on said substrate; and

providing a feedback control system to monitor and control said array of nanotubes growing on said substrate.

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54. (New) The method of manufacturing a carbon nanotube as recited in claim 53, wherein said feedback control system comprises an optical system.

55. (New) The method of manufacturing a carbon nanotube as recited in claim 53, including:

limiting said growing of said nanotubes on said substrate to a specific size.

56. (New) The method of manufacturing a carbon nanotube as recited in claim 53, including:

limiting said growing of said nanotubes on said substrate to a specific length.

57. (New) The method as recited in claim 53, including:

limiting said growing of said nanotubes on said substrate to a specific diameter.

58. (New) A method of manufacturing a carbon nanotube, comprising:

growing a first carbon nanotube from a growth site; and
growing a second nanotube from said growth site.

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59. (New) The method as recited in claim 58, wherein said growth site is a semiconducting junction.

60. (New) The method as recited in claim 59, wherein said first and second nanotubes are in axial alignment with one another.

61. (New) The method as recited in claim 59, wherein said semiconducting junction is disposed in a substrate.

62. (New) A method of manufacturing a carbon nanotube device comprising:

arranging a substrate material with a set of specific location growth sites on said substrate;

growing an array of carbon nanotubes at said growth sites on said substrate wherein said nanotubes have a controlled dimension.

63. (New) The method as recited in claim 62, wherein said controlled dimension of said nanotubes comprises the length of said nanotubes.

64. (New) The method as recited in claim 62, wherein said growth sites are comprised of apertures arranged in said substrate.

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65. (New) The method as recited in claim 64, wherein said apertures have a metallic catalyst deposited therein.

66. (New) The method as recited in claim 62, including:
tapering an edge portion of said substrate material.

67. (New) The method as recited in claim 62, including:
doping at least part of said substrate to render at least part of
said substrate polarized.

68. (New) The method as recited in claim 62, including:
polarizing at least part of said substrate.

69. (New) A method of manufacturing a carbon nanotube array comprising:
providing a substrate
arranging an ordered pattern of growth sites on said
substrate; and
growing nanotubes on said growth sites on said substrate.

70. (New) The method as recited in claim 69, including:
growing said substrate to a specific length.

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71. (New) The method as recited in claim 69, wherein said growth sites are comprised of a metal.
72. (New) The method as recited in claim 69, wherein said growth sites are comprised of a metal oxide.
73. (New) The method as recited in claim 69, wherein said substrate is comprised of silicon.
74. (New) The method as recited in claim 69, wherein said substrate is comprised of a doped material.
75. (New) A method of manufacturing a carbon nanotube array, said array comprising a plurality of aligned spaced-apart periodic carbon nanotubes on a substrate, comprising:
 - preparing a plurality of periodic growth site locations on said substrate, said locations comprising depressions on said substrate;
 - depositing a nanoparticle in said depressions on said substrate; and
 - growing nanotubes on said substrate from said nanoparticles in said depressions on said substrate.

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76. (New) A method of manufacturing a nanotube array comprising:
growing said nanotubes to a specific size.

77. (New) A method of manufacturing a carbon nanotube array
comprising:
growing said nanotubes to a specific length.

78. (New) A method of controlling the manufacture of carbon
nanotubes on a substrate comprising:
providing a substrate with a plurality of growth locations
thereon;
heating said substrate in a chamber;
introducing a carbon bearing gas to said chamber to create
carbon nanotubes on said growth locations on said substrate;
applying an external controlling field to said chamber during
said heating of said substrate; and
controlling growth of nanotubes growing on said substrate
by said external controlling field.

79. (New) The method of claim 78, wherein said external controlling
field comprises a static electric field.

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80. (New) The method of claim 78, wherein said external controlling field comprises a magnetic field.

81. (New) The method of claim 78, wherein said external controlling field comprises an electromagnetic field.

82. (New) The method of claim 78, including:

influencing a separation of said nanotubes by effecting adjacent repulsion between said nanotubes.